LETTERS TO THE EDITOR.

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Meteorological Conditions of a Blizzard.

I AM glad to see Mr. Bostwick's protest against the current use of the word "blizzard," and agree with him that the British Isles, excluding mountains like Ben Nevis, cannot produce the conditions for a real blizzard.

There can be no comparison between the phenomenon as it occurs in North America and the polar regions and the very mild imitation commonly called a blizzard in the English daily Press. In most cases the latter consists of a mixture of snow and rain, perhaps not amounting to more than 0·10 in. in all, and a wind not exceeding a strong breeze.

The only approach to a blizzard in the S.E. of England during the last fifty years was on January 18, 1881. On that occasion the dry snow and the gale were present, but not the low temperature. Much inconvenience was caused by the drifts and stoppage of traffic, but hundreds of thousands of persons probably made their usual outdoor journeys on that day in their usual clothing without danger, a thing they could not have done had the third condition of a really low temperature been fulfilled.

W. H. DINES.

Benson, Wallingford.

Economic Work of the Geological Surveys.

THE note on Sir Robert Hadfield's address to a Committee of the Advisory Council for Scientific Research, given in NATURE for May 25 (vol. xcvii., p. 264), suggests that the speaker was ill-informed as to the recent history of the Geological Surveys of our islands. The activities of what Sir Robert Hadfield styles "the Geological Survey" have naturally been "restricted" as regards Ireland, since the Geological Survey of that country was placed under the Irish Department of Agriculture and Technical Instruction so far back as 1905. So soon as the need for more detailed information as to our mineral resources became apparent, through the pressure of military operations, the staff in Ireland was devoted to the preparation of a reference index to all known mines and mineral localities in the country, and the inquiries that are almost daily dealt with already show the utility of the material thus brought together.

The remark quoted from Sir Robert Hadfield's address as to the basis on which our knowledge of Irish minerals rests must surely refer to some officer in England. The Department of Agriculture in Ireland employs, in addition to the staff of its Geological Survey, an officer entitled the "Economic Geologist," possessed of special mining qualifications, whose advice is always at the service of those who may be desirous of developing mineral industry in the country. Surely the combined work of the Geological Surveys and of the mining officials already employed in the public service should obviate the creation of a new "Central Imperial Bureau." The deficiency of information has long been due to public ignorance of the value of the material brought together by public servants, an ignorance unhappily shared by many who pose as mine prospectors.

GRENVILLE A. J. COLE.

Geological Survey of Ireland,
14 Hume Street, Dublin, May 27.

ANTARCTIC PHYSIOGRAPHY.[1]

DR. GRIFFITH TAYLOR, physiographer to the Commonwealth of Australia, accompanied Capt. Scott's last Antarctic Expedition as its chief physiographer, and in this interesting volume he records his experiences, gives brief summaries of his observations and conclusions, and describes the daily life and incidents of the enterprise. His scientific results will be given more fully and connectedly in the special volumes on the work of the expedition. His narrative is mainly of interest as a preliminary statement of his conclusions, and for his racy account of the life of the expedition and pleasing picture of the good humour and happy comradeship between all its members.

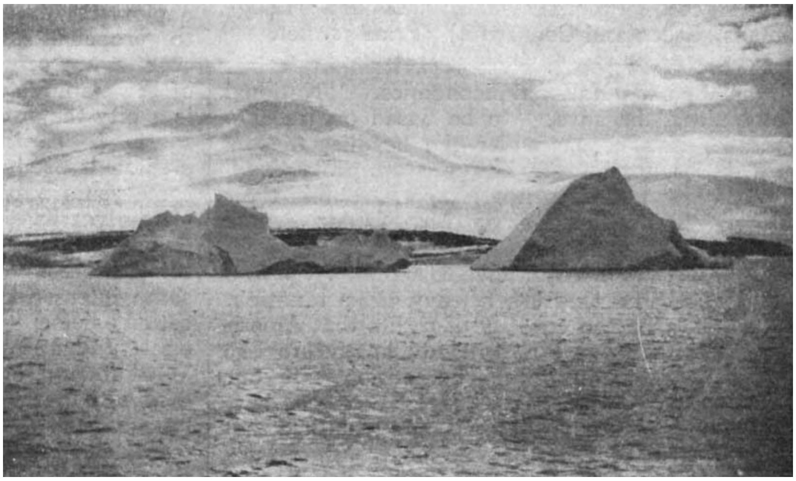

FIG. 1.—Photo from the ship of Cape Evans, January 26, 1911. The Tunnel Berg appears on the right. Behind is the dark line of the Ramp, and twelve miles away the cone of Erebus with a small steam cloud. From "With Scott: The Silver Lining."

Dr. Taylor's chief contributions to the history of the expedition are his accounts of the voyage from New Zealand to Macmurdo Sound, of the winter's life at the base there, and of the two expeditions under his command to the mainland on the western side of Macmurdo Sound. During his sledge journeys in that area he was able to supplement the observations of Ferrar, David, and Mawson, and by combining all the materials available has produced the most detailed map of any part of eastern Antarctica. It is an area of special interest, as the glaciers descend towards the coast through a series of remarkable valleys which notch the edge of the Antarctic plateau. Dr. Taylor's party followed the Ferrar Glacier westward to an upper section, which has been named the Taylor Glacier. The origin of the glacier valleys has not yet been fully explained, but the solution of the problem may be furnished by the detailed geological and geographical information collected by Dr. Taylor and his comrades.

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[1] "With Scott: The Silver Lining." By Dr. Griffith Taylor. Pp. xiv+464. (London: Smith, Elder, and Co., 1916.) Price 18s. net.

Dr. Taylor's special attraction to Antarctica was the opportunity of studying the physiography of an area where water action had been always either absent or relatively insignificant compared with glacial erosion. It is interesting to note that his Antarctic studies have led him to reduce the importance he had once assigned to ice erosion. He now attaches more importance to the shattering action of frost than to the actual erosive influence of glacier ice. The front of the Antarctic plateau which rises above the Ross Sea has been hollowed into the great rounded depressions known as corries or cirques; and these features have long been attributed by many glacialists to the direct excavating action of glaciers. Dr. Taylor, however, adopts the conclusion that they are essentially due to the action of frost. This explanation was first clearly advanced by Prof. Cole in 1895, and though long rejected it has been largely adopted in recent years. The indefiniteness of the characters used to distinguish glacial from water erosion is illustrated by some of Dr. Taylor's observations. Thus he figures a hill slope which appears to be an ordinary denudation curve; he attributes this catenary curve to glacial erosion, whereas probably most glacialists regard the opposite denudation curve, which is oversteepened at the end owing to the toe of the slope having been worn away, as the characteristic feature of glacial denudation.

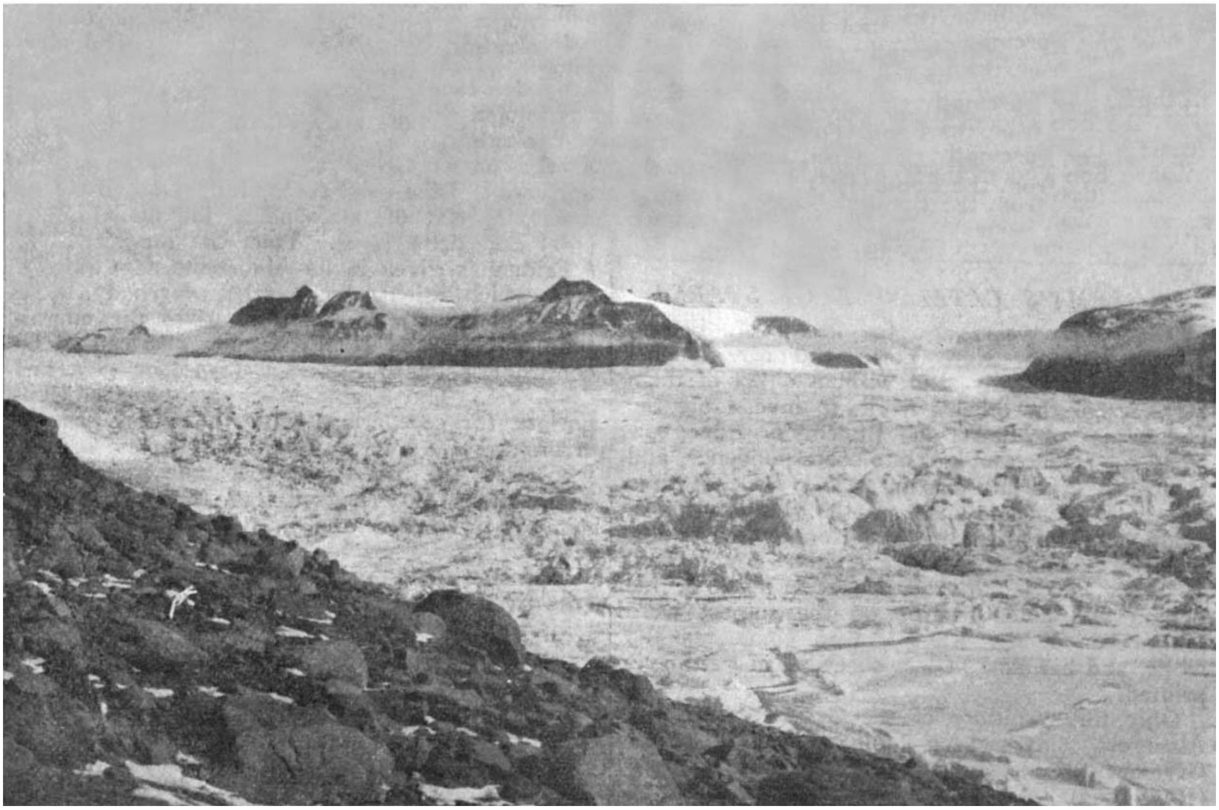

FIG. 2.—The field of crevasses (Skauk) at the root of Mackay Tongue, January 6, 1912. Behind are the faceted slopes of Mount Allan Thomson. Photo from the Flat Iron looking N.W. From "With Scott: The Silver Lining."

One item in Dr. Taylor's physiographic nomenclature is open to regret, since he has followed a growing custom of adopting an ordinary German term with a special technical meaning. He uses the term "riegel" for a rock bar across a glaciated valley. In his first reference to the structure he calls it a bar or riegel; but afterwards he uses only the latter. The word "bar" is the recognised English term, and it is used in geography, and there seems no need to introduce a foreign word. German authors adopt the term "riegel" because it is the natural word for them to use in describing this structure; and there seems no more reason why British authors should call such a formation a riegel than why German geographers should call it a bar. It may be said that the term "bar" is ambiguous, and can only be understood by the context, but exactly the same objection applies to "riegel."

In reference to the general physiographic Antarctic problems, it is interesting to note that

Dr. Taylor believes in the connection advocated by Filchner between the Ross and Weddell Seas. From the account of the researches by Dr. Simpson it appears not improbable that the most important of the scientific results of the expedition will be the additions to Antarctic meteorology.

The book is illustrated by numerous excellent photographs, including some by the expert Antarctic photographer, Mr. Ponting, and also many instructive and ingenious diagrammatic sketches by Dr. Taylor. He publishes a photograph of the *Discovery* Hut in which he lived for a month, and the title directs attention to one feature which shows that the hut was not built as designed; for it is raised on supports which were only to have been used if the hut had to be erected on ice into which they could have been easily sunk.

One interesting psychic incident is recorded. At about the time when Amundsen turned back from the South Pole his compatriot Gran had a dream to that effect, and promptly recorded it in one of Dr. Taylor's books. The author regards it as a coincidence, but his remarks suggest that he is not very confident of this explanation.

PTOLEMY'S CATALOGUE OF STARS.[1]

JUST forty years ago the late Prof. Peters, of Clinton, New York, and Mr. Knobel began independently, and without either of them knowing of the other's work, to investigate the Catalogue of Stars in Ptolemy's Almagest. They soon, however, got into correspondence, and eventually met in Paris in 1887. By that time Peters had collated most of the manuscripts in Continental libraries, and Mr. Knobel then undertook to examine those in England. Peters died in 1890, and in November, 1891, most of his papers and notes bearing on the subject were forwarded to Mr. Knobel, who completed the work, and has now at last suceeded in getting it printed

Only three editions of the Greek text of the Almagest have been published, those of Grynæus (1538), Halma (1813–16), and Heiberg (1898–1903). A valuable German translation by Manitius came out three years ago. Of the Star Catalogue there have been several separate editions, the best of which is that of Baily (Mem. R. Astr. Soc., vol. xiii.). But from an astronomer's point of view no previous edition can compare with the one we are considering here, as this is founded on an examination of a great number of codices—Greek, Latin, and Arabic—and contains, besides, many other things for which astronomers looked in vain in the earlier editions.

The investigation of Peters differs from those hitherto made, as he began by calculating from Piazzi's star-places and Mädler-Bradley's proper motions the longitudes and latitudes of all Ptolemy's stars for the epoch A.D. 100, for the purpose of identifying the stars and getting an idea of the accuracy of the positions. This was done before Auwers had published his new reduction of Bradley's observations, and it would have been worth while to examine what difference the adoption of Auwers's proper motions would have made, though the main results of the investigation would doubtless not have been affected. The work also differs from all others in the number of codices consulted. In all, twenty-one Greek and eight Latin codices of the Almagest were examined, and also three Arabic codices of the Almagest, ten of Al Sûfi's Uranometry (the catalogue in which is that of Ptolemy, with a constant correction for precession), and one of Nasir-ed-din Al Tûsi's Compendium of the Almagest. Detailed notes on the first thirty-three of these codices and three photographic plates are appended; the latter help to make the reader understand the principal sources of error in the catalogue.

The original catalogue was doubtless written in the uncial Greek characters of the second century, and the most common error in all manuscripts is that of confounding the uncial alpha (=1) and delta (=4). Thus the magnitude of θ Eridani is given in all Almagests as 1 instead of 4, which hitherto has puzzled everybody, while the Bodleian Greek Almagest gives the magnitude of Sirius as 4. Errors are also caused by confusion between A and Λ (=30) or ε=5 and θ=9, etc. The Arabic MSS. are especially important for comparison with the Greek, as the errors are of a different kind. Unlike the Greeks, who wrote the minutes of longitude and latitude as fractions of a degree, the Arabs wrote the minutes in figures, and thus these two different methods form a valuable check one on the other.

The star-places finally adopted by the authors are given in three catalogues. The first contains for each star: Baily's number, the number and Latin description of the star from the Latin edition printed in 1528, the Flamsteed number and Bayer's letter, the longitude, latitude, and magnitude. The second catalogue repeats the last three items, and gives the longitude and latitude computed from Piazzi for the epoch A.D. 100, and the difference between these and Ptolemy's values; also the magnitude from the revised Harvard Photometry. The third catalogue gives Ptolemy's longitudes reduced by 2° 40′, being the difference which Ptolemy states he found between the longitudes of Hipparchus and those of his own time, and the latitudes unaltered; also the positions computed for 130 B.C. After a lengthy set of notes on various stars follow tables collating a number of codices as regards longitude, latitude, and magnitude.

Most writers have been of the opinion that Ptolemy's catalogue was nothing but that of Hipparchus, the longitudes being altered by adding 2° 40′ for precession. Peters had already published in 1877 a paper showing that modern star-places, reduced to A.D. 100 and compared with those of Ptolemy, gave a mean correction to his longitudes = +34·9′, making his epoch

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[1] "Ptolemy's Catalogue of Stars. A Revision of the Almagest." By Dr. C. H. F. Peters and E. B. Knobel. Pp. 207. (Washington: Carnegie Institution, 1915.)